flow in the brain" by
Humberto Mestre. Both talks are the result of a collaboration and it would benefit the audience if the talks are presented sequentially.

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Cerebrospinal fluid bulk flow is driven by the cardiac cycle JEFFREY TITHOF, University of Rochester, HUMBERTO MESTRE, University of Rochester Medical Center, JOHN THOMAS, University of Rochester, MAIKEN NEDERGAARD, University of Rochester Medical Center, DOUGLAS KELLEY, University of Rochester — Recent discoveries have uncovered a cerebrospinal fluid (CSF) transport system in the perivascular spaces (PVS) of the mammalian brain which clears excess extracellular fluid and protein waste products. The oscillatory pattern of CSF flow has long been attributed to arterial pulsations due to cardiac contractility but limitations in imaging techniques have impeded quantitative measurement of flow rates within the PVS. In this talk, we describe quantitative measurements from the first ever direct imaging of CSF flow in the PVS of a mouse brain. We perform particle tracking velocimetry to obtain time-resolved velocity measurements. To identify the cardiac and/or respiratory dependence of the flow, while imaging, we simultaneously record the mouse's electrocardiogram and respiration. Our measurements conclusively indicate that CSF pulsatility in the arterial PVS is directly driven by the cardiac cycle and not by the respiratory cycle or cerebral vasomotion. These results offer a substantial step forward in understanding bulk flow of CSF in the mammalian brain and may have important implications related to neurodegenerative diseases.

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